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Observation of the radiative decay mode of the neutron T.R. GENTILE, K.J. COAKLEY, M.S. DEWEY, H.P. MUMM, J.S. NICO, A.K. THOMPSON, NIST, B.M. FISHER, I. KREMSKY, F.E. WIETFELDT, Tulane U., R.L. COOPER, T.E. CHUPP, U. Michigan, E.J. BEISE, K.G. KIRILUK, U. Maryland, J. BYRNE, U. Sussex — We report observation of the radiative decay mode of the neutron, in which the usual decay products are accompanied by an inner-bremsstrahlung photon. The experiment was carried out at the fundamental physics beam line at the National Institute of Standards and Technology (NIST) Center for Neutron Research (NCNR) Photons with energies between 15 keV and 340 keV were detected by a scintillating crystal coupled to an avalanche photodiode and were distinguished from uncorrelated background photons by coincidence with both the decay electron and proton. Correlated background from prompt external bremsstrahlung generated in the electron detector is estimated to be a small effect. We have studied the predicted dependence of the radiative process on the available phase space of the decay, which provides a unique signature of radiative decay. We report our measurements of the branching ratio for this rare decay.

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